Essentials: Shock

Assessment and Treatment

SHOCK IS DEFINED as inadequate delivery of oxygenated blood (perfusion) to the tissues and organs of the body. Insufficient perfusion results in deranged cell function initially and eventually cell death if left untreated. Climbers should be able to recognize the early signs of shock, assess its severity, and initiate treatment in order to maximize chances of recovery and prevent death. Documenting the signs of shock and changes in vital signs can provide critical information to first responders and medical caregivers.

Shock is a medical emergency, not to be confused with the term “shock” often incorrectly used to describe an acute stress response. In stressful scenarios, people may exhibit signs and symptoms that mimic the early stages of true shock but are transient and not a result of diminished perfusion. The short-lived effects of an acute stress response will usually last less than 15 minutes.

Causes of shock in the climbing and mountaineering environment can include severe dehydration from diarrhea, loss of blood from external or internal bleeding, impaired cardiac function, heart attack, severe allergic reaction, or spinal injury.

Shock is commonly classified in one of three categories: cardiogenic, hypovo- lemic, and vasogenic. These groupings correspond to the root cause of the shock physiology. Wilderness medicine educators often relate categories of shock to basic plumbing principles. Using this analogy, the complex physiology of shock can be simplified as problems originating with the pump (cardiogenic), not enough fluid (hypovolemic), or the pipes (vasogenic).

Cardiogenic shock is from the failure of the heart to pump blood effectively throughout the body. A heart attack causing poor pump function is an example of cardiogenic shock.

Hypovolemic shock results from low fluid volume within the system and is typically preventable with early recognition and management. Causes include fluid loss such as from bleeding, diarrhea, vomiting, or lack of oral fluid intake.

Vasogenic shock describes a loss of tone in the blood vessels (pipes) and thus increased space and decreased pressure within the system. This type of shock can be caused by a spinal cord injury, severe allergic reaction (anaphylaxis), or a sys- tem-wide infection (sepsis).

RECOGNITION AND ASSESSMENT

Recognizing shock requires the identification of likely causes and changes in vital signs characteristic of this condition. Assessment is based on trending of vital signs and symptoms, and can be divided into early and late stages. The following signs and symptoms describe the various stages of shock:

Early/Compensated Shock: The body struggles to maintain adequate circulation and blood pressure in response to reduced perfusion. Compensatory mechanisms include increased heart rate, increased respiratory rate, and constriction of blood vessels, especially in the skin. The patient’s mental status may be anxious and restless. The skin may be pale, cool, and clammy (moist). A

stable radial (wrist) pulse is present.

Late/Decompensated Shock: As compensation mechanisms begin to fail, inadequate perfusion detrimentally affects critical organs such as the brain. The patient may show disorientation, decreased alertness, and drowsiness. The skin is increasingly pale, cool, and clammy. Radial pulse weakens.

Late/Irreversible Shock: Cell and organ death result from continued lack of perfusion. The patient is unresponsive. The skin is cyanotic (blue) or ashen (gray). Radial pulse disappears.

FIELD TREATMENT

Shock is a medical emergency and wilderness treatment should focus on patient assessment, stabilization, and evacuation to definitive medical care.

- Treat the underlying cause.
  - Cardiogenic: Basic life suppor tincluding airway management and cardiopulmonary resuscitation (CPR).
  - Hypovolemic: Control bleeding. Consider oral fluid replacement in any shock patient with normal mental status and the ability to swallow. Replace fluids orally at a maximum rate of one liter per hour.
  - Vasogenic: Treatments for shock of vasogenic origin are typically advanced and require evacuation to definitive medical care. Specific initial response to spinal cord injuries, anaphylaxis, and sepsis include spinal immobilization/restriction, administration of epinephrine, and an antibioticregimen, respectively.
- Lay the patient flat.
- Consider elevating his or her legs.
- Keep the patient warm.
- Monitor vital signs every 5–15 minutes.
- If available, consider invasive fluid replacement (intravenous or intraosseous) and oxygen therapy.
- Evacuate any shock patient whose condition does not improve.

ADVANCED TREATMENT

Mild hypovolemic shock is usually the sole cause of this physiology that can be completely managed in the field. Advanced treatments for shock necessitate pre-hospital (ambulance) or hospital settings. Ultimately, prompt recognition, stabilization, documentation, and evacuation to definitive medical care are the most effective field treatments for the majority of these medical emergencies.

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ADDITIONAL RESOURCES

First Aid/Shock, Wikibooks

What is shock?, Khan Academy (video)
Auerbach PS, Constance BB, Freer L. Field Guide to Wilderness Medicine. 4th ed. Philadelphia, PA: Elsevier Mosby; 2013. p. 136-139.
Johnson C, Anderson S, Dallimore J, Winser S, Warrell DA. Oxford Handbook of Expedition and

Wilderness Medicine. 2nd ed. Oxford University Press, Oxford, UK 2015. p. 212-214.

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